

Abstract for: AGU, 2014
San Francisco, CA
December 15-19, 2014

Spacecraft Charging in Geostationary Transfer Orbit

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The 700 km x 5.8 Re orbit of the two Van Allen Probes spacecraft provide a unique opportunity to investigate spacecraft charging in geostationary transfer orbits. We use records from the Helium Oxygen Proton Electron (HOPE) plasma spectrometer to identify candidate surface charging events based on the “ion line” charging signature in the ion records. We summarize the energetic particle environment and the conditions necessary for charging to occur in this environment. We discuss the altitude, duration, and magnitude of events observed in the Van Allen Probes from the beginning of the mission to present time. In addition, we explore what information the dual satellites provide on the spatial and temporal variations in the charging environments.